

NAME _____ LAB TIME/DATE _____

REVIEW SHEET
exercise

17

Histology of Nervous Tissue

1. The cellular unit of the nervous system is the neuron. What is the major function of this cell type?

To generate and transmit nerve impulses.

2. Name four types of neuroglia in the CNS, and list at least four functions of these cells. (You will need to consult your textbook for this.)

Types

Functions

a. *microglia*

a. *phagocytosis of debris (dead cells, bacteria, etc.)*

b. *oligodendrocytes*

b. *package (myelinate) neuron processes in the CNS*

c. *astrocytes*

c. *support the neurons; may serve nutritive function and help regulate*

the chemical environment of the neurons

d. *ependymal cells*

d. *line cavities of the brain (and spinal cord); aid in circulation of*

cerebrospinal fluid

3. Match each statement with a response chosen from the key.

- | | | | |
|------|---------------------------|----------------------|------------------------------|
| Key: | a. afferent neuron | e. ganglion | i. nuclei |
| | b. association neuron | f. neuroglia | j. peripheral nervous system |
| | c. central nervous system | g. neurotransmitters | k. synapse |
| | d. efferent neuron | h. nerve | l. tract |

c 1. the brain and spinal cord collectively

j 6. spinal and cranial nerves and ganglia

f 2. specialized supporting cells in the CNS

e 7. collection of nerve cell bodies found outside the CNS

k 3. junction or point of close contact between neurons

d 8. neuron that conducts impulses away from the CNS to muscles and glands

l 4. a bundle of nerve processes inside the central nervous system

a 9. neuron that conducts impulses toward the CNS from the body periphery

b 5. neuron serving as part of the conduction pathway between sensory and motor neurons

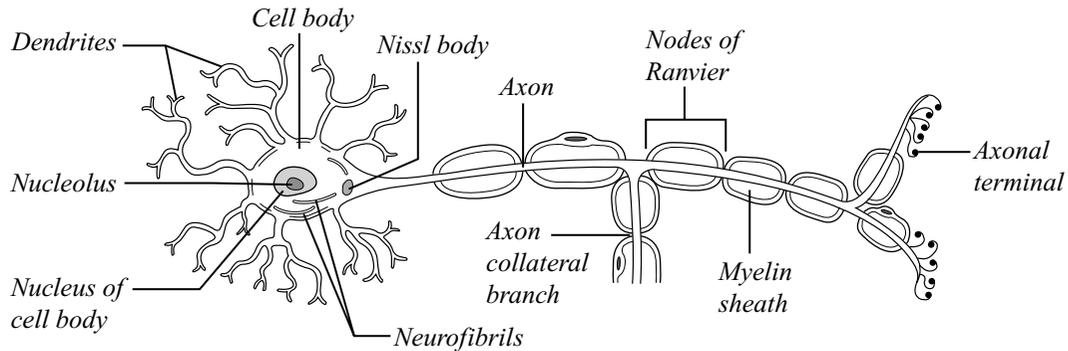
g 10. chemicals released by neurons that stimulate or inhibit other neurons or effectors

Neuron Anatomy

4. Match the following anatomical terms (column B) with the appropriate description or function (column A).

Column A	Column B
<u>c</u> 1. region of the cell body from which the axon originates	a. axon
<u>b</u> 2. secretes neurotransmitters	b. axonal terminal
<u>d</u> 3. receptive region of a neuron	c. axon hillock
<u>e</u> 4. insulates the nerve fibers	d. dendrite
<u>g</u> 5. is site of the nucleus and the most important metabolic area	e. myelin sheath
<u>f</u> 6. may be involved in the transport of substances within the neuron	f. neurofibril
<u>h</u> 7. essentially rough endoplasmic reticulum, important metabolically	g. neuronal cell body
<u>a</u> 8. impulse generator and transmitter	h. Nissl bodies

5. Draw a "typical" neuron in the space below. Include and label the following structures on your diagram: cell body, nucleus, nucleolus, Nissl bodies, dendrites, axon, axon collateral branch, myelin sheath, nodes of Ranvier, axonal terminals, and neurofibrils.

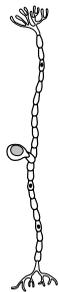


6. How is one-way conduction at synapses ensured? Generally speaking, neurotransmitters are released by axonal endings.

7. What anatomical characteristic determines whether a particular neuron is classified as unipolar, bipolar, or multipolar?

The number of processes issuing from the cell body.

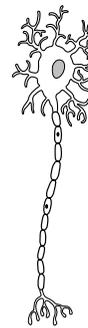
Make a simple line drawing of each type here.



Unipolar neuron



Bipolar neuron

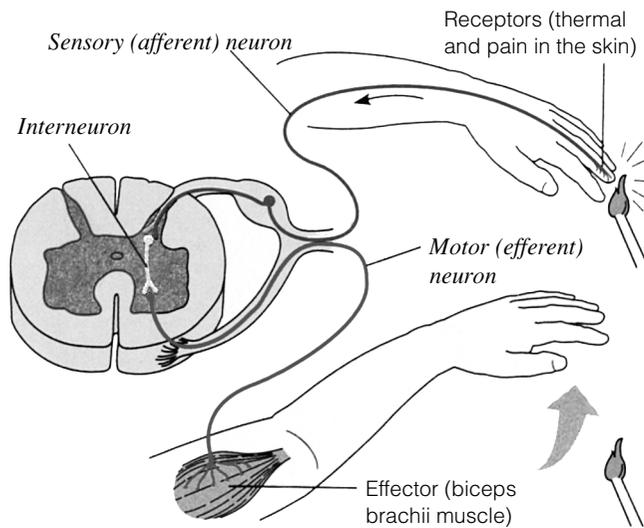


Multipolar neuron

8. Correctly identify the sensory (afferent) neuron, association neuron (interneuron), and motor (efferent) neuron in the figure below.

Which of these neuron types is/are unipolar? Sensory neuron

Which is/are most likely multipolar? Motor neuron, interneuron



9. Describe how the Schwann cells form the myelin sheath and the neurilemma encasing the nerve processes. (You may want to diagram the process.)

Schwann cells lie against the axon and then begin to wrap themselves around it jellyroll fashion, thus forming a tight coil of
membranous material which forms the myelin sheath. The neurilemma is the outermost (exposed) Schwann cell membrane.

Structure of a Nerve

10. What is a nerve? A bundle of neuron processes wrapped in connective tissue wrappings. Extends from the CNS to structures of the
body viscera or periphery.

11. State the location of each of the following connective tissue coverings:

endoneurium: Surrounds the neuron process.

perineurium: Surrounds a bundle of neuron processes.

epineurium: Surrounds all of the neuron processes contributing to a nerve.

12. What is the value of the connective tissue wrappings found in a nerve? To protect and insulate the delicate nerve fibers.

13. Define *mixed nerve*: Nerve containing both motor (efferent) and sensory (afferent) fibers.

14. Identify all indicated parts of the nerve section.

